

## **ABSTRACT OF THE DISCLOSURE**

Methods for designing magnetic coils, particularly open gradient coils, and  
5 methods and systems for using open coils for diagnostic, testing, and laboratory systems.  
A method for designing coils may include characterizing an integrated current density  
distribution of a coil in terms of a stream function. The stream function may be a sum of  
sinusoidal functions. Parameters of the stream function may be numerically optimized to  
produce a coil design of selected characteristics.